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Issues relating to the Globally Harmonized System of Classification and Labelling of Chemicals: joint work with the GHS Sub-Committee

Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals

Thirty-fifth session
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Item 3 (b) of the provisional agenda
Classification criteria and related hazard communication: review of Chapter 2.1

Outline for a potential amended classification system for explosives in the GHS

Transmitted by the expert from Sweden*

Background

1. Since 2015 work has been on-going to revise Chapter 2.1 of the GHS, which is the chapter containing the classification and labelling provision for explosive substances, mixtures and articles (Explosives). The work is done within an Informal Correspondence Group (ICG) which currently consists of almost fifty experts, and is led by the expert from Sweden[1]. The progress of the work has continuously been reported to the Sub-Committee of Experts on the GHS (SCEGHS) and the Sub-Committee of Experts on the Transport of

* In accordance with the programme of work of the SCEGHS for 2017–2018 approved by the Committee at its eighth session (ST/SG/AC.10/C.4/64, paragraph 67, and ST/SG/AC.10/44, paragraph 14).

[1] See section III, sub-section A, of the report from the twenty-ninth session of the Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals, ST/SG/AC.10/C.4/58.

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Dangerous Goods (SCETDG)[2]. According to the Programme of Work for the group[3], the work is set to be completed during the current biennium.

2. In the latest status report on the work[4] an amended classification system for Explosives in the GHS was described, which was also presented at the (thirty-fourth sessioin) meeting of SCEGHS. Discussions within the ICG have circulated around a modified classification system for some time now, although there is hesitation from some ICG-members on the need for such a radical change and concerns as regards potential downstream consequences. While it is recognised that opinions are still divided within the ICG – on the idea as such as well as on many details – this paper presents the outline of the amended system to the Sub-committees. This paper is presented by the expert from Sweden in his capacity as leader of the ICG. He has however tried to take account of most comments from the ICG when a draft of this paper was circulated.

Description of the problem

3. The main reason for the review of Chapter 2.1 is that the current classification and labelling system poses difficulties when it comes to Explosives that are not packaged or configured for transport.[5] The background to this is that the GHS adopted the classification system used in the Model Regulations on the Transport of Dangerous Goods (Model Regulations) to classify Explosives, which relies on them being packaged or configured for the purpose of transportation. The particular packaging or configuration can be decisive for the classification as it may be designed to mitigate the explosive effects of the substance, mixture or article, for safe transportation. The explosive behaviour of the substance, mixture or article may thus be different (more severe) outside of this packaging/configuration, but the current GHS system is not capable of reflecting this.

4. The GHS is a system for classification and labelling of chemicals which could be applied to a variety of situations, such as supply, use, manufacturing, processing, storage, and transport. A classification that depends on a certain packaging or configuration, e.g. that for transport, cannot comfortably be used for situations where that packaging or configuration doesn't exists. So while the current classification system for Explosives can appropriately classify explosive substances, mixtures and articles as packaged or configured for transport, it is often difficult to apply whenever they are not in this packaging or configuration.

5. A dubious GHS classification may, in turn, lead to inaccurate hazard communication, as e.g. reflected on the GHS label or in GHS safety data sheets. (This may for instance lead to detonating articles such as blasting caps being labelled in the same way as very minor consumer fireworks such as sparkles.) Misleading hazard communication may obviously constitute a safety concern through insufficient safety measures being taken upon handling the Explosive in question. The difficulties of the current GHS system to classify and appropriately communicate the hazard of explosives that are not packaged/configured for transport constitutes the core of the problem that the ICG has been trying to tackle.

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[2] See informal documents INF.10 (GHS, thirty-fourth session) - INF20 (TDG, fifty-second session), INF.7 (GHS, thirty-third session) - INF.15 (TDG, fifty-first session), INF.8 (GHS, thirty-second session) - INF.11 (TDG, fiftieth session), INF.10 (GHS, thirty-first session) - INF.37(TDG, forty-ninth session), INF.9 (GHS, thirtieth session) - INF.32 (TDG, forty-eighth session).

[3] See informal document INF.13 (GHS, thirty-third session) - INF.44 (TDG, fifty-first session) and section III, sub-section B of the report from the thirty-third session of the SCEGHS, ST/SG/AC.10/C.4/66.

[4] Informal document INF.10 (GHS, thirty-fourth session) - INF20 (TDG, fifty-second session).

[5] See also the initiating paper from the expert from Australia, ST/SG/AC.10/C.3/2014/79–ST/SG/AC.10/C.4/2014/15.

Potential solution - a new layer of classification

6. The ICG has discussed how to resolve the problems described above. Since the autumn of 2016, these discussions have revolved around a possible amended classification system for Explosives in the GHS. However, as the current Division-based system performs well for Explosives in a transport packaging or configuration, and is widely used in regulations also beyond transportation (such as storage), the ICG acknowledges the need for the (transport) Divisions, to be retained in the classification system. Another agreed prerequisite for any amended classification system is that it doesn't extend the scope of the current hazard class of Explosives, and that no new mandatory testing is introduced.

7. To provide a solution that can fit the needs described within the boundaries stated, the ICG has lately considered a classification system that amends the existing one by adding a layer of differentiation that is independent of the (transport) packaging or configuration. This gives a new dimension of flexibility in that a choice can be made of whether to refer to the Divisions used to classify Explosives in their (transport) packaging/configuration or whether to refer to a classification that is independent of that parameter, e.g. for some regulatory purposes. The system that the ICG is currently refining has this characteristic:

GHS Category	**1**	**2**		
GHS Sub-category	*Not applicable*	**2A**	**2B**	**2C**
Transport classification	*Not applicable*	Class 1 (any Division)		

8. In this system, all Explosives that have been assigned a Division in accordance with the classification procedure of the Model Regulations belong to Category 2, which is therefore identical in scope to Class 1 of transport and provides straight-forward consistency between the GHS and the Model Regulations. Within this Category 2, however, Explosives are differentiated according their hazardous behaviour regardless of any particular (transport) packaging or configuration. The Sub-categories 2A, 2B and 2C within Category 2 represents a high hazard, medium hazard and low hazard, respectively, and are thus organised in the normal GHS-fashion (which the Divisions are not). While still subject to discussion, criteria for these Sub-categories were tentatively agreed when the ICG met in December 2017[6], which are displayed in Annex 1 to this paper. Some later amendments suggested in correspondence within the ICG have also been included.

9. Category 1 of the system contains Explosives that have not been assigned a Division. The reason for this can be that they are not packaged/configured for transport or that they are considered too dangerous to transport and hence are rejected from Class 1 of transport (the latter termed "Unstable explosives" in the current GHS system). It should be emphasised that Category 1 is intended to only comprise substances, mixtures and articles that belong to the current GHS hazard class of Explosives – no change in scope of the hazard class as such is thus intended. The draft criteria of Category 1, as discussed within the ICG, to accomplish this are displayed in Annex to this paper. With Category 1 a way is thus opened for classification of Explosives not in the (transport) packaging/configuration, which currently doesn't exist in the GHS.

10. By using the (sub-)categories of the classification system as outlined above as the basis for GHS hazard communication, the dependence on particular (transport) packagings/configurations can be avoided. This allows the hazard communication to describe

[6] See informal document INF.20 (GHS, thirty-fourth session) – INF.57 (TDG, fifty-seventh session).

the effect of an explosive substance, mixture or article independent of that (variable) parameter. While the ICG has not yet come to a consensus on all the hazard communication elements, the following table represents the suggestion around which the discussions have revolved lately:

Category	**1**	**2**		
Sub-category	*Not applicable*	**2A**	**2B**	**2C**
Division (for transport[7])	*Not applicable*	1.1, 1.2, 1.3, 1.4, 1.5 or 1.6	1.4 *(subject to further criteria)*	1.4 *(subject to further criteria)*
Symbol[8]	Exploding bomb	Exploding bomb	Exploding bomb	*No symbol*
Signal word	Danger	Danger	Warning	Warning
Hazard statement	*To be determined*	Explosive	Fire or projection hazard	Fire or projection hazard

11. As displayed in the table above, Explosives in Sub-category 2A would be assigned the hazard statement "Explosive" regardless of their Division for transport. This is unlike the current GHS-classification system where the hazard statements are tied to the Divisions, and hence to the explosive behaviour in the (transport) packaging/configuration. Only Explosives in Sub-categories 2B or 2C would be assigned the less severe hazard statement "Fire or projection hazard", as for these the explosive hazard is not deemed "high" regardless of any particular packaging/configuration. In this way the current situation where a "high hazard" Explosive may escape more severe hazard communication due to its (transport) packaging or configuration is avoided.

12. An effect of the above is, naturally, that the (transport) Division cannot be read from the GHS-label (which it currently indirectly can via the hazard statement), and the ICG has discussed how this information could be inserted. One suggestion would be to use a precautionary statement for this, e.g. by amending the already existing P234 to read "Keep in original package. [Division ... as originally packaged/configured for transport.]" This precautionary statement, including the text in square brackets, would be applicable to all Explosives in Category 2, together with appropriate conditions for use ("..." is where the number of the Division for transport is to be inserted). This idea needs further consideration though, and also other options to accomplish the same effect are under discussion.

Summary and action

13. The introduction of the amended GHS-system for classification and labelling as outlined in this paper would solve the problem of classification of Explosives that are not in a (transport) packaging or configuration as well as remove the dependency of the GHS hazard communication on that packaging/ configuration. While it does constitute a major change to the current system it retains the currently used (transport) Divisions, and downstream regulations relying on this classification can continue to use it as a basis also in the future.

14. While the amended GHS system for classification and labelling of Explosive developed by the ICG is not yet sufficiently ripe for a sharp proposal for changes to GHS Chapter 2.1 to be made, it is now in a stage where discussions in the ICG revolve around perfecting it rather than about the principle as such. With reference to the Programme of Work, the expert from Sweden therefore believes this is an appropriate time to invite the Sub-committees to discuss whether a new system as outlined above could in principle be an acceptable way to resolve the current problems of Chapter 2.1, recognising that the details still remain to be worked out.

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[7] Views are divided within the ICG on whether a Division in principle can also be assigned in other situations than in the transport packaging or configuration.

[8] It is recognised that other symbols are used for Divisions 1.4, 1.5 and 1.6 for transport, according to the Model Regulations. No changes to these are intended.

Annex

Tentative criteria for an amended GHS classification system for Explosives (under development)

Texts in normal font are the tentatively agreed criteria as presented in INF.20 to the 34th session of the SCEGHS (INF.57 to the 52nd session of the SCETDG), including provisional criteria from then in square brackets. Later correspondence within the ICG has resulted in refined criteria for Category 1 which are shown in italics. Italic text in square brackets are other suggestions from ICG-members that have not been further evaluated yet.

Category	1	2
Criteria	*Substances, mixtures and articles which:* *- are manufactured with the intention of producing a practical explosive or pyrotechnic effect; or* *- are substances or mixtures that give positive results in Test series 2; or* *- [are articles that give positive results in Test series 4; or]* *- are [candidates for] ANE that give positive results in Test 8(a).* *unless they* *- meet the criteria for a Division within ~~Class 1 for transport~~ the class of explosives according to the Manual of Tests and Criteria; or* *- are substances or mixtures not manufactured with the intention of producing a practical explosive or pyrotechnic effect which are excluded from this hazard class by results in Test series 6; or* *- are articles excluded by definition in 2.1.1.2(b); or* *- are [candidates for] ANE that give negative results in Tests 8(a) - (c).*	Substances, mixtures and articles which meet the criteria for a Division within ~~Class 1 for transport~~ *the class of explosives according to the Manual of Tests and Criteria.*

Sub-category	2A	2B	2C
Criteria	Substances, mixtures and articles not meeting the criteria for Sub-categories 2B or 2C.	Substances, mixtures and articles meeting the criteria for Division 1.4, Compatibility group* C or G, according to the Model Regulations and where: - there is no indication that the packaging is designed such that the hazard is reduced, e.g. no special packing instructions/criteria required, and no special orientation or dividers required to pass Test series 6 as Division 1.4, and - there is no violent reaction in Test 6a or 6b without mass explosion; and - [for unintentional explosives possible further criteria based on data from other tests.]	Substances, mixtures and articles meeting the criteria for Division 1.4, Compatibility group* S, according to the Model Regulations and where: - there is no indication that the packaging is designed such that the hazard is reduced, e.g. no special packing instructions/criteria required, and no special orientation or dividers required to pass Test Series 6 as Division 1.4, Compatibility group* S; and - there is no violent reaction in Test 6a or 6b without mass explosion; and - [for articles, the individual article or the smallest inner packaging unit fulfils the criteria of Division 1.4, Compatibility group* S, according to Test 6(d); and] - [for unintentional explosives possible further criteria based on data from other tests; and] - *[the explosive is Compatibility group* C or G outside of the packaging.]*

* Compatibility groups are defined in Chapter 2.1, section 2.1.2, of the Model Regulations.